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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,668	04/13/2001	Kameran Azadet	13-5	5633

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EXAMINER

TORRES, JOSEPH D

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/834,668

Applicant(s)

AZADET ET AL.

Examiner

Joseph D. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 4 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 19-36, 39 and 40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-15, 17, 18, 37 and 38 is/are rejected.
- 7) ☒ Claim(s) 9 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I in the reply filed on 21 June 2004 is acknowledged.

This application contains claims 19-36, 39 and 40 drawn to an invention nonelected with traverse in Paper No. 5. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Drawings***

2. The drawings were received on 21 June 2004. These drawings are accepted.

### ***Specification***

3. In view of the amendment filed 21 June 2004, the Examiner withdraws all objections to the specification.

### ***Response to Arguments***

4. Applicant's arguments filed 21 June 2004 have been fully considered but they are not persuasive.

The Applicant contends, "Applicants note that, whether or not the method of claim 8 actually uses pipelining, claims 8 and 15 require that the methods must allow for

pipelining to be used before or after each of said selections. Claims 1 and 12 are not required to allow such pipelining. Thus, claims 8 and 15 further limit their parent claims and are definite". Claim 1 is a method including the steps of selecting. If the method includes the steps of selecting it is unclear how the method can be pipelined before or after the steps of selecting, hence it is unclear what pipelining refers to. Since the claim only states that it allows for pipelining, which is indefinite as pointed out above, it remains unclear what limitation claims 8 and 15 add.

The Applicant contends, "Applicants note that the hyphen in the cited language means that the number two refers to the number of dimensions, not the number of branch metrics. As the Examiner notes, and as is apparent to a person of ordinary skill in the art, no hyphen is used after a number to indicate a quantity of the entity (branch metrics) and a hyphen after a number is used to indicate that the number refers to the number of dimensions". The Examiner asserts at least two two-dimensional branch metrics would be correct, at least three two-dimensional branch metrics would be correct, but "at least two-dimensional branch metrics" is grammatically incorrect since it lacks a modifier to indicate what "at least" is referring to.

The Examiner disagrees with the applicant and maintains all 35 U.S.C. 112 rejections of original claims 8, 10, 11, 15, 17 and 18. All amendments and arguments by the applicant have been considered. All 35 U.S.C. 112 rejections are maintained.

The Applicant contends, "Applicants note that Mui does not teach to precompute branch metrics, i.e., does not compute branch metrics ahead of time for future decisions".

The Examiner disagrees and asserts that Viterbi's algorithm inherently requires a branch metric computation calculated prior to determining a new path metric.

The Applicant contends, "Mui also does not teach to select a branch metric from a plurality of precomputed branch metrics based on a second past decision from a corresponding state".

The Examiner disagrees and asserts that Viterbi's algorithm inherently requires branch metric calculations at nodes on a Trellis prior to updating state metrics for most likely paths and selecting a branch metrics to update state metrics for most likely paths based on previously calculated state metrics.

The Applicant contends, "Independent claims 1, 12, 37, and 38 require precomputing branch metrics based on said precomputed intersymbol interference estimates or computing a branch metric based on said selected precomputed intersymbol interference estimates".

The Examiner disagrees and asserts that the Abstract in Mui teaches an ISIC decoder for computing branch metrics for each current branch based on a single-sided template  $q(x,y)$  that accounts for postcursor ISI in a partially equalized sequence; hence a single-sided template  $q(x,y)$  that accounts for postcursor ISI is a precomputed intersymbol interference estimate. Hence Mui teaches precomputing branch metrics based on said

precomputed intersymbol interference estimates  $q(x,y)$  or computing a branch metric based on said selected precomputed intersymbol interference estimates  $q(x,y)$ , as recited in independent claims 1, 12, 37, and 38.

In response to applicant's arguments, the recitation "In addition, Mui's invention does not use a "reduced-state sequence estimation technique."" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

The Examiner asserts that even if the Applicant were to amend claims 1, 12, 37, and 38 to recite "reduced-state sequence estimation technique" in the body of the claim, such language is functional language indicated intended use but does not impart any structural change. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997) and *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "Applicants also note that Mui (col. 25, lines 35-60) does not teach to precompute

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speculative intersymbol interference estimates for a first postcursor tap of said channel impulse response based on each possible value for a data symbol") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Note: claim 1 recites, "precomputing intersymbol interference estimates based on a combination of (i) speculative partial intersymbol interference estimates for a first postcursor tap of said channel impulse response" not "Applicants also note that Mui (col. 25, lines 35-60) does not teach to precompute speculative intersymbol interference estimates for a first postcursor tap of said channel impulse response based on each possible value for a data symbol".

The Applicant contends, "Templates  $q(x,y)$  are not equal to partial intersymbol interference estimates".

The Examiner disagrees and asserts that col. 12, lines 37-44 of Mui explicitly teach "the equalizer tap weights are pre-computed and preloaded into the partial equalizer. The templates are either preloaded into the template generator or computed when needed by the template generator using a set of preloaded coefficients representing the ISI profile at the output of the partial equalizer". Since the  $q(x,y)$  templates are based on coefficients representing the ISI profile at the output of the partial equalizer, templates  $q(x,y)$  are substantially partial intersymbol interference estimates.

The Applicant contends, "Mui (FIG. 17) does not teach that (x,y) is a survivor symbol, and Mui does not teach that (x,y) is a decision from a corresponding state"

The Examiner disagrees and asserts that col. 12, lines 24-36 of Mui teach "x is the vector of symbols associated with the past branch or branches connected to a current branch in the decoding trellis", that is, x is a vector of symbols associated with a previously selected branch, i.e., a vector of surviving symbols.

The Applicant contends, ""Survivor symbol" is a well known term in the art that refers to the symbols retained for each surviving path in the Viterbi algorithm.

The Examiner disagrees and asserts that "surviving path" is a well known term and adlibbing a new term "Survivor symbol" from "surviving path" does not make "Survivor symbol" a well known term.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "Regarding claim 4, Mui (col. 33, lines 65-57) does not teach to select one branch metric among precomputed ones based on an add-compare select decision. Also, the Viterbi algorithm does not select one branch metric among precomputed ones based on add-compare-select decisions") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Note: claim 4 recites, "said first or second past decision from a



corresponding state includes an add-compare select decisions" and does not state "select one branch metric among precomputed ones based on an add-compare select decision".

The Applicant contends, "'reduced-state sequence estimation", "decision-feedback sequence estimation" "delayed decision-feedback sequence estimation" and "parallel decision feedback decoding" are distinctly different from the Viterbi algorithm and from Mui's disclosed technique."

The Examiner disagrees and asserts that Figure 16, 17 and 18 in Mui all teach feedback processing during decision sequence estimation, hence all use "decision-feedback sequence estimation".

The Examiner disagrees with the applicant and maintains all rejections of original claims 1-8, 10-15, 17, 18, 37 and 38. All amendments and arguments by the applicant have been considered. It is the Examiner's conclusion that original claims 1-8, 10-15, 17, 18, 37 and 38 are not patentably distinct or non-obvious over the prior art of record in view of the reference, Mui; Shou Yee (US 6690739 B1) as applied in the last office action, filed 21 June 2004. Therefore, the rejection is maintained.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-8, 10-15, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Mui; Shou Yee (US 6690739 B1; Note: the effective filing date is 14 January 2000).

See the Non-Final Action filed 21 June 2004 for detailed action of prior rejections.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mui; Shou Yee (US 6690739 B1; Note: the effective filing date is 14 January 2000).

See the Non-Final Action filed 21 June 2004 for detailed action of prior rejections.

***Allowable Subject Matter***

7. Claims 9 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

See the Non-Final Action filed 21 June 2004 for detailed action of prior rejections.

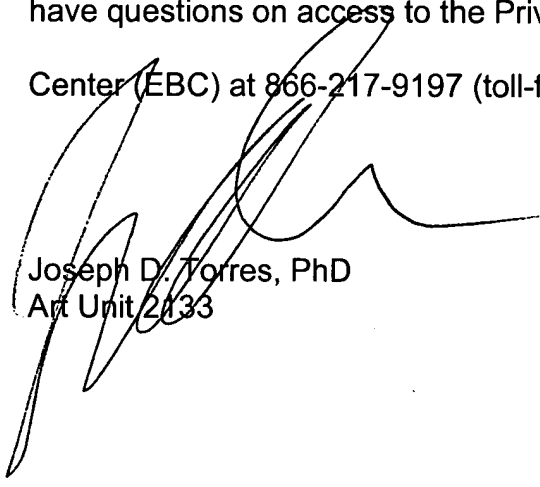
***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph D. Torres, PhD  
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